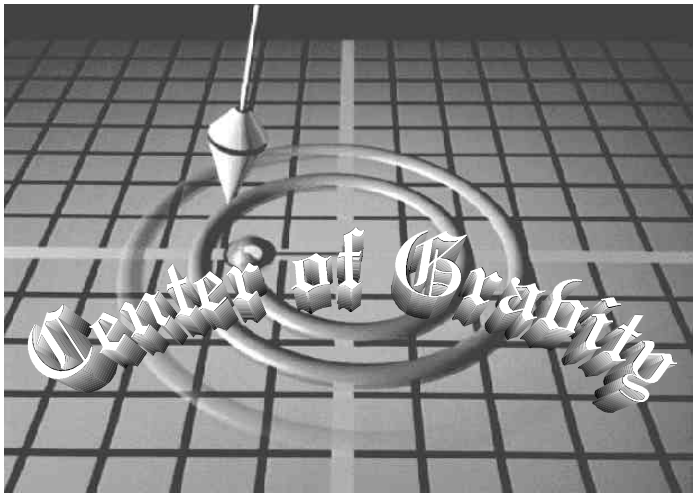

DETERMINATION, ANALYSIS, AND APPLICATION

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The views expressed in this report are those of the authors and do not necessarily reflect the official policy or position of the Department of the Army, the Department of Defense, or the U.S. Government. Further, these views do not reflect the uniform agreement of all subject matter experts at the Army War College. This report presents a reasonable approach to center of gravity determination; however, several contentious issues remain regarding the concepts, processes, and approaches discussed. This report is cleared for public release; distribution is unlimited.

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Comments pertaining to this report are invited and should be forwarded to: Center for Strategic Leadership, U.S. Army War College, Carlisle Barracks, PA 17013-5050. Comments also may be conveyed directly to the authors by calling commercial (717) 245-3190 or DSN 242-3190.

FOREWORD

The design and conduct of campaigns and major operations begins with defining the center of gravity. Center of gravity determination is essential for maintaining focus on goals and aims, for the proper allocation and usage of military resources, for maximizing the effectiveness of plans, and for denying the enemy the achievement of his aims. Correctly identifying the center of gravity is critical to the success or failure of military campaigns.

This study offers a method for determining the center of gravity of any entity or actor, friendly or enemy; for analyzing campaign options; and for applying center of gravity determinations to the planning and execution of the campaign. This study is the result of two years research by senior "experts" and case studies performed by Army War College students from all Services. The resulting model is not only robust and flexible, but it is also simple enough for any strategic planner or student of the art of war to use in learning about center of gravity concepts and processes.

As Clausewitz has said, "Everything in war is very simple, but the simplest thing is difficult." This phrase applies to Clausewitz and his rendition of "On War" as well. The concept of Center of Gravity is so simple, yet the faculty of the Army War College can debate its meaning for years, the U.S. military can interpret it to mean different things, military forces throughout the world can understand the idea in different ways. Clearly the center of gravity determination is a controversial topic for many reasons. Among them is the fact that each Service has a different view of what constitutes a center of gravity, because each Service has a different perspective of the battlefield. On the question of "is there one center of gravity or multiple centers of gravity," this model may violate current views of doctrine. The authors have chosen one view and that is reflected in the model. The reader should be aware that this model of center of gravity determination, analysis, and application represents one view of a very difficult subject.

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SUMMARY

This monograph outlines and discusses a simple yet robust process for determining, analyzing, and applying center of gravity selection in a campaign plan. Center of gravity determination is a critical concept, yet it is poorly understood and inconsistently applied. It means something to everyone, but not the same thing to anyone. Most people do not apply a rational assessment of the strategic environment in center of gravity determination. The process used by many amounts to throwing a laundry list of candidates on the blackboard, debating them, then reluctantly choosing one so they can proceed. Further, many planning groups tend to ignore their center of gravity selections as they develop campaign plans, creating self fulfilling problems.

The procedure outlined in this monograph is the result of a two-year research effort. Researchers conducted thorough interviews with seven U.S. Army War College faculty experts. Seventeen students, including Army, Navy, and Air Force officers, analyzed historical and hypothetical case studies. The Center for Strategic Leadership offered Army War College electives directed at researching the center of gravity determination process. The Army War College Knowledge Engineering/Artificial Intelligence staff synthesized the information gained in these study programs and created the models.

The views expressed in this report are not in uniform agreement with all subject matter experts at the Army War College. Instead, the authors believe this report presents a reasonable approach to center of gravity determination. However, several contentious issues remain regarding the concepts, processes, and approaches discussed.

The basic process for determining, analyzing, and applying the center of gravity selection described in this monograph is conducted in three phases: Situation, Determination and Analysis, and Application. The steps are outlined below:

PHASE I: SITUATION. Analyze the situation - consider relevant aspects of the strategic and theater environments.

PHASE II: DETERMINATION AND ANALYSIS.

- Determine the strategic center of gravity: identify and test all logical strategic center of gravity candidates and determine the strategic center of gravity.

- Analyze the strategic center of gravity: consider suitable, feasible, and acceptable approaches to influence the strategic center of gravity.

- Determine the operational center of gravity: identify and test all logical operational center of gravity candidates and determine the operational center of gravity.

- Analyze the operational center of gravity: input the operational center of gravity selection into the operation planning process.

PHASE III: APPLICATION. Apply the results - use center of gravity selections to focus war efforts and campaign plans.

Also available from the authors are:

- Dynamic process model software. The dynamic model is an automated stand-alone executable that steps through the process in much more detail. The dynamic model provides multiple windows of various levels of information, tracks user input, and saves a scenario for further reloading and use. The model was designed for educational purposes - to teach center of gravity concepts and focus students on the issues.

- A static process model in the form of a wall chart depicting the procedure described in this monograph.

- A comprehensive collection of articles addressing center of gravity via literature searches conducted during the past two years. The collection of articles includes an annotated bibliography and an interesting section of "Quotes from the Experts" regarding various center of gravity areas and issues.

CENTER OF GRAVITY: DETERMINATION, ANALYSIS, AND APPLICATION

INTRODUCTION

> "One must keep the dominant characteristics of both belligerents in mind. Out of these characteristics a certain center of gravity develops, the hub of all power and movement, upon which everything depends. That is the point against which all our energies should be directed . . . "
>
> Carl Von Clausewitz

The concept of a center of gravity was introduced by Carl von Clausewitz in his classic text "On War" in 1832. The center of gravity is defined as the foundation of capability — what Clausewitz called the "hub of all power and movement, on which everything depends . . . the point which all our energies should be directed." Each combatant has a unique center of gravity at the strategic level of war, providing the critical link among the strategic, operational, and tactical levels of war. Should a combatant eliminate or influence the enemy's strategic center of gravity, the enemy would lose control of its power and resources and eventually fall to defeat. Should a combatant fail to adequately protect his own strategic center of gravity, he invites disaster. In addition, each combatant has a center of gravity at the operational level of war, providing power and movement to the combatant's operational forces.

Linking the operational center of gravity to the strategic center of gravity provides the theater commander a foundation on which to establish decisive points. Decisive points, as defined in the Department of the Army's Field Manual 100-5, *Operations*, "provide tactical commanders with a marked advantage over the enemy and greatly influence the outcome of the campaign. Decisive points are often geographical in nature such as a hill, a town, or a base of operations. They could also include elements that sustain command such as a command post, critical boundary, airspace, or communications node. Decisive points are not centers of gravity;

they are the keys to getting at centers of gravity." Whenever the strategic center of gravity is not linked among the strategic, operational, and tactical levels of war, a nation will involve its military in something pointless and devoid of sense. For example, the U.S. forces in Vietnam won every major campaign and battle fought, but were unable to defeat the government of Ho Chi Min. The tactical victories and decisive points were not linked to the Democratic Peoples Republic of Vietnam's (North Vietnam) strategic center of gravity; therefore, strategic victory was not attainable.

The key to successful campaign planning begins with an accurate assessment of the strategic and operational centers of gravity. During Operation Desert Storm, the Commander in Chief Central Command (CINCENT) assessed the Iraqi strategic center of gravity as the command, control, and leadership of the Saddam Hussein regime, and the operational center of gravity as the Iraqi Republican Guard. This identification provided the coalition forces focal points to apply its elements of combat power in order to impose their will over Iraqi forces.

The improper identification or miscalculation of the strategic center of gravity can lead to disastrous results for a nation. Japan's decision to attack Pearl Harbor is a historical example of such a miscalculation. The Japanese Imperial General Headquarters failed to accurately assess the United States' strategic center of gravity. The true strategic center of gravity of the United States was the will of its people, not the naval fleet located at Pearl Harbor. Had Japan avoided attacking American possessions and instead concentrated its military power only on the British and Dutch, President Roosevelt would have found it awkward trying to win support for a war in the Pacific in defense of distant European colonies in Asia.

The identification of the strategic and operational centers of gravity in campaign planning is where the dilemma begins. Joint Publication 3.0, *Doctrine for Joint Operations* states, "Identification of enemy centers of gravity requires detailed knowledge and understanding of how opponents organize, fight, make decisions, and their physical and psychological strengths and weaknesses." Unfortunately, Joint Publication 3.0 does not provide a process to accurately identify the center of gravity. The Department of the Army's Field Manual 100-5, *Operations*, states "The center of

gravity is useful as an analytical tool to cause the joint commander and his staff to think about their own and the enemy's sources of strength as they design the campaign and determine its objectives." As stated, FM 100-5 stresses the importance of the identification of the center of gravity, but also leaves the reader with no determination process.

This monograph is organized as follows:

- Assumptions and beliefs concerning center of gravity concepts, issues, and the center of gravity determination procedure.

- A step-by-step description of the center of gravity determination, analysis, and application procedure.

- A discussion of several controversial topics relating to center of gravity determination and the opinions held by the authors regarding them.

ASSUMPTIONS AND BELIEFS

The study of center of gravity, like most studies, begins with defining various beliefs and assumptions regarding the concepts and issues. Some of the assumptions and beliefs described below are also reflected in the "Contentious Issues" portion of this monograph.

1. The term *force* will be used to describe the strategic, operational, or tactical elements for one combatant in a campaign. A combatant can be a single nation, state, or group; an alliance or coalition or nations, states, or groups; or a set of non-allied nations, states, or groups. This document will discuss center of gravity determination at the strategic and operational levels for a given force.

2. A center of gravity exists for each force.

3. While war is very complex, nonlinear, and dynamic and is impacted by a myriad of important variables which planners must consider, the strategic center of gravity is usually some aspect of that which controls the state, alliance, coalition, or group. The operational center of gravity is typically some aspect of the military force(s). The strategic center of gravity is found at the strategic

national level while the operational center of gravity is found at the strategic theater level.

4. The strategic center of gravity is the root source of power and strength for a force. It is never a weakness or vulnerability relative to other assets on the same side (although it may be vulnerable to a stronger adversary if not properly protected).

5. There is one - not many - strategic center of gravity. The term "strategic center of gravity" should not to be confused with the terms "strategic target(s)," "decisive point(s)," "critical asset(s)," or "key vulnerabilities." It is counterproductive to mislabel every important part of the complex enemy system (targets) as somehow being "centers" of gravity.

6. While an operational level center of gravity is heavily dependent on objectives, the strategic center of gravity is fixed. It is not relative to objectives, capabilities or willingness to utilize capabilities. The enemy's source of power and strength does not change just because you are not willing or capable of imposing your will on it.

7. Center of gravity determination, if properly conducted, serves two principal purposes:

- It forces an up front assessment of what ultimately must be done to achieve aims and, consequently, forces an assessment of whether interests are important enough to justify the associated costs and risks.

- It is the foundation and provides the focus for campaign planning. It does not - and is not supposed to -explicitly tell how to conduct the campaign.

8. Centers of gravity are generally well protected and hard to defeat or neutralize. Merely attacking weaknesses and vulnerabilities is attractive because it is easier; however, you may not accomplish yours aims and, in fact, become embroiled in a quagmire through such improperly focused efforts. You must successfully impose your will on the opposing forces' centers of gravity to win.

9. If the political objectives are less than the destruction of the enemy state, the objectives affect how much or how you strike at the center of gravity - not what it is.

THE CENTER OF GRAVITY DETERMINATION, ANALYSIS, AND APPLICATION PROCESS

The process for center of gravity determination, analysis, and application is modeled in three basic phases called Situation, Determination and Analysis, and Application. The Situation phase is an analysis of the situation which results in an assessment of the relevant aspects of the strategic and theater environments. The second phase, Determination and Analysis, describes steps to determine, test, and analyze the strategic center of gravity; and steps to determine, test, and analyze the operational center of gravity. The final phase, Application, describes steps to properly use center of gravity selections to focus war efforts and campaign plans.

The factors and their implications and relationships discussed in the first phase of the model, the Situation, can be very complex and intricate. There may be other factors and other important questions to consider depending on the particular situation. This phase offers the opportunity for collecting pertinent information prior to launching into the actual center of gravity determination.

PHASE I: SITUATION — Consider Relevant Aspects of the Strategic and Theater Environments.

1. *Demographic factors*

   - Make-up of the population? Dominant majority race, creed, or tribe? Equal mix of various races, creeds, or tribes? How intelligent are they? How independent are they?

   - Is the population segregated either geographically or socially? Or is the population freely integrated? If segregated, are the elements antagonistic or do they accept each other?

- Social make-up? Do the people fall into feudal hierarchies? Or do the people have some degree of self-determination?

2. *Economic Factors*

   - What are the infrastructures of the opposing forces?

   - To what degree can the forces self-sustain? Are the forces dependent on external support?

   - Is their economy scalable?

   - What economies fund their military power? Is it agrarian? Industrial?

3. *Geographic Factors*

   - What is the geographic make-up? Island or Continental? Size and type of terrain?

   - What is the distance between the forces? Between the forces and the support bases?

   - What limitations does the terrain impose on a force? Its opponents?

4. *Historic Factors*

   - What were the likely centers of gravity in previous conflicts? Could they be a reasonable candidate for centers of gravity now?

   - What changes in government and/or the populace have occurred since the previous conflict?

   - What is the history of rivalry or animosity between the opposing forces?

5. *International Factors*

   - What are the character and posture of any alliances or coalitions to which the forces belong or align?

- What international commitments are a particular force involved in? What is the scope of those commitments?

- How is the force viewed in the international community? Respected as a leader? Accepted as a follower? Ignored? Despised or distrusted?

6. *Military Factors*

- What role does the military leadership play in the government? Do they run the government? Do they serve under civilian authority? Have they become an opposition element against the government?

- Are the services (army, navy, air force) relatively equal in strength or influence? Or does one service dominate?

- What is the nature of their military doctrine? Offensive? Defensive? To what extent would they employ Operations Other Than War?

- Is the military oriented to the strategic level or strictly the operational?

- What are the military's strengths and weaknesses?

- How modern is the military's equipment? Where do they draw their equipment from?

7. *Political Factors*

- What is the form of government?

- What are the vital interests?

- How well does the population support the government?

- How much does the population have a say in government?

- Is the government repressive?

8. *Psychosocial Factors*

   - How "happy" or "satisfied" is the population with their conditions? Are their basic needs met? Are they comfortable? Or is population stricken by wide-spread poverty?

   - To what degree is the population influenced by government leaders? Religious leaders? The media? Other non-political speakers or groups?

   - How strong is the will of the population? How strongly do they support their government's goals and aims?

   - How do they perceive the scenario in question, and how does it compare to their perception of previous events? (This is different from merely comparing historic facts. A population's perception of an event is as good as reality.)

9. *Interests and Political Goals*

   - What are the interests and goals of the opposing elements?

   - How moral and acceptable are these interests and goals in the eyes of its own people? Its opposing forces? The international community as a whole?

Once the above factors are considered, one must identify all the distinct enemy forces involved. This is significant because there is one strategic center of gravity per force. Forces are distinct if they are independent with respect to all the above factors. Using WWII as an example, the Axis forces of Germany and Italy constituted one enemy force as they were not completely independent actors; however, Japan and the two other Axis forces were completely independent and truly constituted two distinct opposing forces.

Situation analysis concludes with determining strategic goals and aims of all forces. These goals and aims are the main focus during the determination phase (achieving your goals and denying the enemy's achievement of his goals).

PHASE II. DETERMINATION AND ANALYSIS

The second phase consists of four substeps — two relating to the strategic center of gravity and two to the operational center of gravity. The model for both is similar:

- Identify all reasonable center of gravity candidates.

- Test each candidate and select the one center of gravity.

It is important to identify all reasonable candidates first before testing them because the testing process may require several iterations in order to identify a single center of gravity.

Perform this phase for each enemy force, as determined from Phase I.

Step IIa: Determine the Strategic Center of Gravity.

The strategic center of gravity is most often some controlling aspect of the nation, state, alliance, coalition, or group. One might typically assume that the center of gravity is a political or military entity; however, potential strategic center of gravity candidates can be found within each of the factors listed in Phase I. For example:

- Economic: Control authority or group which controls commerce or industry.

- Geographic: A country's center of communications and control.

- Psychosocial: Will of the people.

There are a number of assessments that can narrow the list of candidates. Detailed assessments made on the following will help identify reasonable center of gravity candidates very quickly. The order of consideration is important because some early assessments may restrict or eliminate other factors in this list.

1. *Composition of Force.* Force compositions are classified as alliances or coalitions, single states or groups, or non-allied groups. The composition of a multi state or multi group force may suggest some center of gravity candidates:

- Alliances and coalitions are either **dominant partner** or **equal partner**, based on whether one force dominates it or if all members share equal power. If dominant, then the combined force likely draws its center of gravity from that of the dominant partner. In this case, only consider center of gravity candidates related to that one force. In either case, the *will of the alliance or coalition* should be considered a candidate.

- Non-allied groups can take many forms, such as rival clans in Somalia; however, their mutual cooperation (or tolerance) is critical if they are to remain a focused opposing force making *cooperation among groups* a worthy center of gravity candidate.

2. *Primary Controlling Element.* Ordinarily, the primary controlling element of a force is its governing body (be it a democracy, dictatorship, etc.). In more modern times (especially in Operations Other Than War) the governing body may be a front for the forces' true source of power, be engaged in a civil war, or simply not exist. Correctly identifying the controlling arm of the force is important and will generate numerous potential candidates:

- Center of gravity candidates of governing bodies typically include individual *political leaders* such as a president, king, dictator, etc. It can also include the *political cabinet, ruling party*, or *staff*.

- Militant groups or clans (not associated with the government military) are likely to have their *group leader* as the center of gravity. Groups of rival clans may have one *dominant clan leader* or an alliance.

- Illegal economic cartels, such as drug lords, can produce candidates relating to the *group leadership*.

- Legal businesses or groups would probably be the primary controlling element if their economic impact on the force is so strong that the governing body is in no position to oversee or control them. In this case, the center of gravity candidates could include the *CEO/Board of Directors,*

Stockholders or Stakeholders in the business (disregarding the implications whether or not war would be waged against businesses).

3. *Type of Government*. Assessing the type of government of an opposing force, as well as its will, provides strategic center of gravity candidates. There are three basic types of governments:

- Democracies. Democracies can be representative, such as the U.S., or parliamentarian, such as Great Britain. The *will of the people* is a candidate for both, and the *will of the parliament* is a candidate for some parliamentarian democracies.

- Totalitarianisms. These can be either military dictatorships or police states. For dictatorships, consider the *military element, dictator,* and/or *staff* as candidates. For police states, consider the *police element, political leader,* or *staff.*

- Feudal Societies. Feudal societies are headed by a *god/king*, which is a likely center of gravity candidate for these types of governments.

4. *Level of Civilization*. Levels of civilization help identify both the economic growth and prosperity of the nation/state and identify the forces' ability to sustain itself during a conflict. More importantly, the level of civilization effects how societies are controlled. There are three levels:

- Pre-Industrial, also known as agrarian. Pre-Industrial societies are controlled by a centralized authority and rely heavily on the strength and capabilities of its *national capital*, which makes it a strong center of gravity candidate.

- Industrial. Industrial societies and their control are much more diverse; however, they may still rely on a particular *commerce authority* or *industry authority*. An example of a commerce authority is the control of a main or sole seaport or airport. Industry authorities might include one

responsible for the manufacture of some strategically important goods (like nuclear fuel or warheads).

- Informational. Because the "informational" or media-driven society is still a new concept, those nation/states that can be considered "informational" have still most likely held to their industrial roots. Therefore, consider the industrial candidates. However, informational societies have further decentralized control because of the increased volume of and access to information. The societies' *information networks or systems* and their controlling authorities are worth considering as candidates.

5. *Other Factors.* Additional strategic center of gravity candidates can be derived through analyses of other relevant factors. These candidates include a special *strategic capability* such as a nuclear threat; *key nonpolitical or independent figures* such as religious leaders, orators, activists, or a special interest organization leaders; and others.

The above analysis should lead to a menu of potential strategic candidates. The following test for a strategic center of gravity must then be applied to each candidate:

Can imposing your will (destroy, defeat, delay) on the potential center of gravity candidate create the deteriorating effect that prevents your foe from achieving his aims and allows the achievement of ours . . . and will it be decisive?

The center of gravity candidate passing the test is selected as the strategic center of gravity. A frequently asked question at this point is "what if more than one center of gravity candidate passes the test?" The authors' interpretation of Clausewitz and their belief in the existence of only one strategic center of gravity suggest that more than one candidate cannot pass the test. The test has been incorrectly applied if a particular assessment indicates more than one strategic center of gravity candidate passing the test. Granted, this is a contentious issue.

Step IIb. Analyze the Strategic Center of Gravity

This critical step addresses need, ability, adverse effects, and willingness of applying direct military action or other approaches to influence the center of gravity. Included in this analysis are the following questions:

- Is the engagement total war or something less? Direct military action is **necessary** if the engagement is total war.

- If engaged in something less than total war, is it essential to destroy/neutralize all of the center of gravity? Direct military action should be considered the strongest option if all of the center of gravity must be destroyed. If not, direct military action may not be essential and other approaches should be considered.

- Does one have the ability to directly impose one's will on the selected center of gravity?

- Will a direct attack cause adverse second and third order effects?

- Is the political leadership willing to directly and decisively engage? Are they willing to pay the costs and/or sustain the effort required?

Failure in any of the last three questions above indicates the need to either reassess ends/means and interests/objectives, or reassess strategic goals and aims before committing to direct military action (to preclude the repeat of historical mistakes). Once various approaches to influence the strategic center of gravity (including direct military action) are deemed viable, major operations and goals are identified.

Step IIc. Determine the Operational Center of Gravity

This step begins with determining operational goals and aims of the opposing force to insure proper focus is maintained during the analysis (to achieve our goals and deny the enemy's). Identifying the operational center of gravity is much simpler than the strategic counterpart. An operational center of gravity is most often described as some dominant characteristic of the opposing force.

Operational center of gravity candidates include the following:

- A dominant allied military element
- The entire military of an allied nation or group
- A dominant joint service element or capability
- A dominant service or capability
- A dominant element within a service
- A dominant capability of a service element
- Threat of intervention from a new power

Examples of candidates from Desert Storm could include the Iraqi Republican Guard (dominant element within a service) and Iraq's capability of delivering weapons of mass destruction (dominant service capability).

Each operational center of gravity candidate must be tested against the following:

Will successful action against the selected candidate decisively achieve our aims and deny the enemy's? And is it the most focused choice that can be selected?

The candidate passing the test is selected as the operational center of gravity. Properly applying the stated test will result in only one most focused operational center of gravity.

Step IId. Analyze the Operational Center of Gravity

This step begins with determining ways to influence the operational center of gravity and the decisiveness of immediate action. This assessment (similar to that conducted during the strategic center of gravity analysis) addresses the ability, will, and need to immediately act and impose one's will on the operational center of gravity and inputs the operational center of gravity selection into the operation planning process. Courses of Actions that maximize indirect influence over the operational center of gravity should be favored if you cannot immediately act and impose your will on the operational center of gravity. If you can immediately act

and impose your will on the operational center of gravity, favor Courses of Actions that provide direct influence.

Based on the courses of action favored, the next step is to determine decisive points and key vulnerabilities.

- Decisive points are defined in the Department of the Army's Field Manual 100-5, *Operations*, "provide tactical commanders with a marked advantage over the enemy and greatly influence the outcome of the campaign. Decisive points are often geographical in nature such as a hill, a town, or a base of operations. They could also include elements that sustain command such as a command post, critical boundary, airspace, or communications node. Decisive points are not centers of gravity; they are the keys to getting at centers of gravity."

- Key vulnerabilities are enemy weaknesses that allow the tactical commander to achieve decisive points.

A list of the eliminated center of gravity candidates could serve as a starting point; however, ***remember that decisive points and key vulnerabilities are not centers of gravity***! Staff estimates are conducted after the decisive points and key vulnerabilities are determined.

PHASE III. APPLICATION

Before continuing, the *friendly* center of gravity must also be known. In the Application Phase, the plan must not only include the methods by which the friendly actors will impact the enemy center of gravity, but also the way the friendly forces will protect their own center of gravity from enemy influence. The process of determining the friendly center of gravity is the same as that used to determine an enemy actor's center of gravity. If needed, perform Phase II using the enemy's perspective to determine the friendly center of gravity.

Once the centers of gravity for all opposing actors have been determined and analyzed, they are used to focus war efforts and campaign plans. Once the plans have begun execution, the situation must continuously be reassessed to detect potential changes or shifts in the enemy center of gravity. This ***re-evaluation loop*** consists of the following items:

- *New elements entering the conflict*. The situation must be reassessed and the centers of gravity redetermined if there are any new elements (allies, coalitions, members, or groups) who have or might enter the conflict. If so, return to Phase I.

- *Changes or shifts in the campaign plan*. The operational center of gravity for the opposing force may need to be reassessed based on campaign shifts or phases. In other words, the operational center of gravity will probably be different for each phase or campaign because goals and objectives will more than likely be different. If this is the case, return to Step IIc of Phase II for the opposing force in question.

- *Changes in capabilities or aims*. The operational center of gravity needs to be reassessed based on new forces entering the theater, significant technology changes (i.e., weapons of mass destruction), or the evolution of new aims. If this is the case, return to Step IIc of Phase II for the opposing force in question.

A frequently heard argument asserts that gaining new information is another situation that may cause the operational center of gravity to change. This argument is invalid because unique centers of gravity exist independent of one's information or knowledge about them. The original assessment and determination led to the selection of an incorrect center of gravity if new information indicates the existence of a different center of gravity.

Certainly if any item changes from Phases I or II that link directly to the selected strategic or operational center of gravity, the continued validity of center of gravity choice should be confirmed.

CONTENTIOUS ISSUES

This center of gravity determination, analysis, and application model provides a structured and thorough process to accurately identify and apply centers of gravity; however, several contentious issues remain. The following issues, along with the authors' positions, seem to be the most contentious:

1. What aspects of the strategic environment impact center of gravity determination?

The nine Phase I factors (demographic, economic, geographic, historic, international, military, political, psychosocial, and interests/goals) adequately describe any strategic environment. Any of these nine categories could produce information that affects center of gravity determination, and each category does produce viable center of gravity candidates.

2. Does center of gravity have applicability in LIC and OOTW operations?

Center of gravity has applicability in LIC and OOTW operations. Several of the categories found in Step IIa (Determine the Strategic Center of Gravity) could be center of gravity candidates in an OOTW or LIC-type scenario. Influencing centers of gravity of these types could carry the same deteriorating effect as would more "conventional" types of center of gravity in a mid-intensity or high-intensity conflict.

3. How many levels of centers of gravity are there and how many are permissible at each level? Can they change and if so, under what conditions?

There are two levels of center of gravity: strategic and operational. The strategic center of gravity is one fixed entity throughout the duration of the conflict unless it is a named individual or group (not a position) and that individual is removed or eliminated.

The operational center of gravity is also one entity, but it is more dynamic. In Phase III, you will perform re-evaluation of the operational center of gravity during the course of campaign execution. Among the reasons why an operational center of gravity can change:

- Change in mission/focus of operational elements from phase to phase

- Significant shift in capability due to emerging technologies (such as the development of new weaponry or acquisition of new electronic equipment)

- Shift in operational goals and aims

- New forces entering the theater

4. What is the relationship between center of gravity determination and other campaign planning activities and design principles?

Once identified, influencing the opposing forces' center of gravity should become the focus of any operation. It should serve as a criterion for evaluating courses of action, and should be measured constantly throughout the conduct of the campaign.

In addition, protecting the friendly center of gravity should carry equal weight when planning and executing the campaign.

5. Is the strategic center of gravity "fixed" or "relative"? Does the ultimate source of power change because of one's objectives, willingness, or capability to act against it?

The strategic center of gravity is fixed, and the objectives, willingness, or capability to act against it have no bearing on the determination of the center of gravity. The only way a strategic center of gravity can change is if it is eliminated or removed and the opposing force re-emerges as a completely different entity, such as:

- If the center of gravity is a dictator who is overthrown, the strategic center of gravity may shift to that of the new regime if it continues the fight.

- If two previously separate opposing forces form an alliance or coalition, the center of gravity of one or both may shift according to the terms of the alliance or agreement.

6. Whose perspective should drive friendly center of gravity determination — theirs, ours, or both?

Assuming the enemy's perspective warrants greatest merit for determining friendly centers of gravity.

- The enemy's perspective will help to gauge what the enemy perceives as the friendly center of gravity and

therefore what the enemy will most likely attempt to influence.

- The enemy's actual method of determining the center of gravity will not likely follow this model, and may not contain any logic or reason whatsoever. Thus there is a danger of deciding to overprotect the wrong item.

- The actual friendly center of gravity, which would be more easily determined using the friendly perspective, should still be protected no matter the circumstances..

7. *If imposing our will on the enemy center of gravity causes him to fall to a decisive defeat, does that mean the center of gravity is a weakness or vulnerability? How does a center of gravity relate to decisive points?*

The center of gravity is not a weakness nor a vulnerability. It is the enemy's source of strength and power, without which it is destined to fall. A vulnerability or a weakness is an aspect of the opposing force that can be easily attacked and hurt. These are normally addressed in operational plans and at the tactical level, and are the means that can be used to influence the operational center of gravity. Exploiting weaknesses and vulnerabilities are clearly important considerations; however, doing so will not cause the deteriorating effect desired unless it influences the center of gravity.

A decisive point is not a center of gravity. A decisive point is best defined as a position, situation, or condition that, once exploited, causes the direction or flow of the battle to change. Decisive points are also considered during operational planning and at the tactical level, and are another means of influencing the operational center of gravity.

8. Can the disparate interpretations of the Army, USN, USMC, and USAF be reconciled in some meaningful joint doctrine?

Joint doctrine regarding centers of gravity is desirable and should be attainable. The issue surrounding the discrepancies lie in the very different ways the services view the battlefield, compounded by the fact that only recently has the center of gravity determination process become an important topic. Many of the current doctrines regarding the definitions of center of gravity are obsolete or out-of-date, and

each of the Services appears to be examining the subject again. As "Jointness" becomes more and more the norm, this issue can be resolved.

To summarize key differences in center of gravity interpretations derived from Service doctrines:

- The Air Force takes a "targeteering" approach and describes multiple centers of gravity in terms of strategic and operational targets throughout the theater of operations. They believe in multiple centers of gravity and that a center of gravity exists at the strategic, operational, and tactical levels.

- The Marine Corps describes the center of gravity as a critical enemy vulnerability and not a source of strength. They focus where the mass of the force is most densely concentrated, more at the operational and tactical levels.

- The Navy has only introduced the center of gravity concept in their doctrine in the past couple of years. They believe in only one center of gravity and that it is a characteristic, capability, or location from which forces derive their freedom of action or will to fight.

- The Army draws directly from Clausewitz and describes the center of gravity as the hub of all power and movement upon which everything depends. They believe that the center of gravity is a characteristic, capability, or location from which enemy and friendly forces derive their freedom of action, physical strength, or will to fight. The Army generally addresses centers of gravity at the strategic and operational levels.

This model can be an important step in resolving the differences. Note that the process uses no Service-specific language. The factors of Phase I are Service-independent, as are the listing and testing of center of gravity candidates in Phase II. Using this model, there should be no reason why strategic planners from different Services should not derive the same strategic center of gravity for any given force.

CONCLUSION

This method for center of gravity determination, analysis, and application is simple yet robust enough for any strategic planner to use in order to learn about center of gravity concepts and processes. The model also provides a tool for strategic planners to insure all areas and issues are addressed during center of gravity assessments. The relevant information gathered during the process will be useful for focusing on and influencing the center of gravity. It also provides the necessary information to subordinate commanders on how the center of gravity was determined and what it means to them. This model delivers a concrete method for tackling what previously has been a very abstract, yet critically important, concept.

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Again, the views expressed in this report are not met with uniform agreement of all subject matter experts and students involved with the study project. This report presents a reasonable approach to center of gravity determination; however, several contentious issues remain regarding the concepts, processes, and approaches discussed. This report is not intended to dismiss the notion or downplay the importance of applying “Strategic or Operational Art” in critical strategic and operational decision-making, but rather to provide a

foundation of some of the many considerations regarding the very complex process of center of gravity determination, analysis, and application.

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A colored static diagram depicting this process is provided. Also available are a dynamic model of the process and a collection of articles. The dynamic model is an automated stand-alone executable that steps through the process in much more detail. The model provides multiple windows of various information, tracks user input, and saves a scenario for further reloading and use. The collection of articles also include an annotated bibliography, and an interesting section of "Quotes from the Experts" regarding various center of gravity areas and issues.

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Admittedly, there may be other viable ways to view center of gravity determination, analysis, and application. Comments are welcome.